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ABSTRACT

A wealth of instructional information is intrinsic to standardized achievement tests. Most practioners fail to realize the availability or potential of item analysis information or are unable to utilize such information appropriately. Achievement tests have not fully accomplished their purposes if the information derived stops at just test scores without the tests affording the information concerning pupils' responses to the items in the test battery. Such information can then provide a real basis upon which teachers can build an effective instructional program in the areas tested. This paper provides a rationale for an unconventional yet meaningful item analysis and describes the procedures which will lead to greater implementation of item analysis data. (Author)

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ITEM ANALYSIS DATA - AN UNCONVENTIONAL APPROACH TO INTERPRETATION AND USE

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A wealth of instructional information is intrinsic to standardized achievement tests. Most practioners fail to realize the availability or potential of item analysis information or are unable to utilize such information appropriately.

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ITEM ANALYSIS DATA - AN UNCONVENTIONAL APPROACH TO INTERPRETATION AND USE

SUMMARY

Objectives

This paper attempts to demonstrate the wealth of instructional information that can be obtained by measurement through the use of standardized achievement tests. Most practioners fail to realize the availability or potential of item analysis information or are unable to utilize such information appropriately.

The paper will not only provide a rationale for an unconventional yet meaningful item analysis but will also describe the procedures which will lead to greater implementation of item analysis data.

Methods and Techniques

School item analysis reports for each grade tested are utilized. The item analysis report presents a new dimension in test reporting, because for the first time full advantage can be taken of computer capabilities to produce a report that is meaningful, relatively easy to interpret and use in planning and implementing programs of instruction designed to overcome weak performance in those areas indicated by the statistical data for the school.

The report presents, in skill order sequence, pupil performance on each test item pertaining to each of the skills being measured. In such a format, the report makes it possible for the user of test data to make comparisons on a skill level basis. It permits ready and easy answers to the following questions:

1. Where are the pupils' strengths?
2. Where are the pupils' weaknesses?
3. How did pupil performance in the school compare with school system's performance at each grade level
4. How did pupil performance in the school compare with national performance at each grade level?
5. How did pupils in the school perform on relatively difficult items?
6. How did pupils in the school perform on items of average difficulty?
7. How did pupils in the school perform on relatively easy items?

Item analysis data are useful mainly in analyzing the characteristics of local test performance. However, for item data to be useful, two kinds of information are necessary for comparison. The first is the school's results which are to be recorded in work table booklets. This is the percent of pupils in the school who answered an item correctly. The second kind of information necessary for comparison is the discrepancies which result when comparisons are made to national item norms.

The data organization procedure requires two documents, and Item Analysis Report and a set of Work Tables for the reduction of the data to a usable format.

The item analysis report should use a consistent format in reporting pupil performance for all grade levels tested. For each subtest of the battery, the following information should be provided:

1. the numbers of the items in the subtest for which data are given
2. the percents of pupils in the grade in the school who completed the entire battery and who answered each item correctly.
3. the percents of pupils in the publisher's standardization population who completed the entire battery and who answered each item correctly.
4. the percents of pupils in the grade in the city who completed the entire battery and who answered each item correctly.

The work tables are used in conjunction with the school item analysis report. An example for a reading comprehension test will illustrate the use of the work tables. Each table contains (1) skills classification for the test, (2) the national midyear norms for item performance, (3) the system end-of-year norms for item performance, and (4) a place to record the actual percent correct for each item for the school. Numbers from the item analysis reports are to be copied, accurately, into the work table for each reading skill.

After the percents have been copied and checked proceed to compute the differences (deviations) between performance in the school and performance in the national sample population and to enter the results in a 'Difference' column. When the differences have been computed and checked find the 'sum of the + differences' and the 'sum of the - differences' as shown in the table.

Directly below each skill area work table, there appears a rectangle outlining a step-by-step procedure for computing the average difference of all the items measuring the particular skill involved.

On front of the work tables booklet, there appears a summary table of the average differences (deviations) for all skill areas for which averages were computed.

Assuming, therefore, that a decision has been reached concerning the skill areas which evidence the greatest need for attention, we next study the work tables for more specific information and a direction to try to pursue in classroom instruction. The third column of the table labeled "Difficulty of Item" attaches to each item a symbol describing the level of difficulty based on how the national population performed on each item.

E - an easy item, answered correctly by 65% or more of the national population and therefore within a reasonable range for most pupils to master.

A - an average item, answered correctly by between 35% and 64% of the national population and therefore capable of mastery by those pupils in the middle of the distribution.

H - a hard item, answered correctly by 34% or fewer of the national population and therefore an item designed to challenge only the more able pupils in any school situation.

It would seem reasonable that those items classified as "Average" or "Easy" where the school's performance level fell below both National and system performance suggest weaknesses and need the most immediate attention. The "Difficult" items, at this level, should be considered but not with equal emphasis.

Those items which signify school performance between the national sample and the city, in most school situations, probably may reasonably be considered as "strengths" which can be effectively used as aids in improving performance. Similarly, those items in which school performance surpassed both the national sample and the city should definitely be regarded as distinct "strengths" in performance and the skills involved can be used to build upon and overcome those skills reflecting weakness.

Data Source

The development and implementation of this procedure for meaningful item analysis was done in the School District of Philadelphia with the cooperation of the Houghton Mifflin Company, Publisher of the Iowa Tests of Basic Skills. The complete paper will contain examples and illustrations of the procedure.

Conclusions

Users have indicated that this item analysis approach provides the kind of assistance which makes it possible for each school to organize a concerted attack on the specific problems within the school which will result in a constructive program of learning activities within the framework of the local curriculum emphases leading to a general improvement in the achievement levels of the pupils throughout the system.

Educational Importance of This Paper

The use of nationally-standardized, norm-referenced achievement testing is under attack because such testing is perceived by many practioners as having very low instructional yield. This paper may help to change that perception to a more favorable one regarding helpfulness and utility.